

WHAT IS CLAIMED IS:

1. A circuit for current regulation, comprising:
 - a regulation circuit coupled to a power supply and configured to generate a regulated current to a load;
 - a mode circuit having an input coupled to a control signal and an output configured to generate a mode signal relating to an open mode and a linear mode associated with the regulation circuit;
 - a comparator having an input coupled to a signal relating to a voltage associated with the regulation circuit, an input coupled to the mode signal and configured to compare the mode signal and the signal relating to the voltage;
 - a switch circuit coupling an output of the comparator to a linear mode control node when the circuit is operating in the linear mode and to an open mode control node when the circuit is operating in the open mode; and a
 - a control circuit coupled to the mode circuit and configured to generate a control signal used in controlling the mode circuit.
2. The circuit of Claim 1, wherein the regulation circuit is a transistor that operates one of the linear control mode and the open mode.
3. The circuit of Claim 1, wherein the mode circuit further comprises a multiplexer and a resistor ladder that is coupled to a reference signal.
4. The circuit of Claim 3, wherein the multiplexer is coupled to the control signal and arranged to select a tap point associated with the resistor ladder.
5. The circuit of Claim 2, wherein the transistor is a PNP transistor.
6. The circuit of Claim 1, wherein the switch circuit is configured to switch from the open mode to the linear control mode when the regulation circuit is in a overloaded state.

7. The circuit of Claim 6, wherein the switch circuit is configured to switch back to the open mode.

8. The circuit of Claim 4, wherein the control generates the control signal such that the multiplexer selects different tap points while the circuit operates in the linear mode.

9. An apparatus for current regulation, comprising:
a transistor configured to operate in a linear control mode and an open mode;
a second node that is coupled to a signal that is proportional to a voltage across the transistor configured to operate in the linear control mode and the open mode;
a comparator having an input coupled to a mode signal, an input coupled to the second node, and arranged to compare the inputs and output an output signal;
a switch circuit coupled to the output signal and configured to couple the output signal to a linear mode node when the circuit is operating in the linear control mode; and to the open mode node when the circuit is operating in the open mode;
a control circuit coupled to the linear mode node and to the open mode node and configured to generate a control signal; and
a mode circuit coupled to the control signal and configured to output the mode signal in response to the control signal.

10. The apparatus of Claim 9, wherein the transistor is a PNP transistor.

11. The apparatus of Claim 10, wherein the mode circuit further comprises a multiplexer coupled to the control signal and a resistor ladder that is coupled to the multiplexer.

12. The apparatus of Claim 10, wherein the mode circuit outputs a constant signal when the circuit is in the open mode.

13. The apparatus of Claim 11, wherein the multiplexer selects tap points in the resistor ladder when the circuit is in the linear mode.

14. The apparatus of Claim 9, further comprising an amplifier having an input coupled to an emitter node, an input coupled to a collector node and an output coupled to a gate; and a transistor coupled to the emitter node and the second node;

15. A method for current regulation of a circuit, comprising:
comparing a signal to an overload signal when in an open mode;
determining when a regulation circuit is overloaded;
changing to a linear mode when overloaded; and when the circuit is in the linear mode:

adjusting a multiplexer to select a tap point in a resistor ladder;

and

comparing the signal to a signal associated with the selected tap point using the same comparator that compared the signal to the overload signal.

16. The method of Claim 15, further comprising switching back to the open mode.

17. An apparatus for current regulation, comprising:
means for comparing a signal to an overload signal when in an open mode;

means for determining when a regulation circuit is overloaded when the circuit is operating in the open mode;

means for changing to a linear mode when the regulation circuit is overloaded; and when the circuit is operating in the linear mode:

means for adjusting a multiplexer to select a tap point in a resistor ladder; and

means for comparing the signal to a signal associated with the selected tap point using the same comparator that compared the signal to the overload signal.

18. The apparatus of Claim 17, further comprising means for switching the circuit back to the open mode.